

## TRAINING MATERIAL

### Title:

Technology for N recovery as mineral concentrate, ammonia water and ammonium sulphate from manure/digestate by VP-Hobe manure and digestate valorisation system

### Training:

#### What is the technology?

The VP-Hobe manure and digestate valorisation system contains different modules that can be used in combination to obtain optimal valorization of the manure.

- Solid-Liquid-separation: Separation takes place in a flotation unit and in a belt filter press. The manure is separated into a solid and a liquid fraction. A flocculant is added. In the flotation system, small air bubbles bring particles to the surface of the tank where it forms a layer of sludge. This layer is scraped off and de-watered in the belt filter press into a solid fraction of 30% dry matter (DM).
- Reverse Osmosis (RO): A RO processes the liquid fraction (1,7% DM) into a retentate concentrated-N/K<sub>2</sub>O product (3,4% DM) and a permeate product to be processed in the clean water production.
- Evaporator/ Stripper/ Scrubber (ESS): The RO-concentrate or thin fraction will be further de-watered in an evaporator. The liquid passes through a falling film evaporator with mechanical vapour recompression. Heating the liquid in the evaporator causes water to evaporate. A vacuum lowers the boiling point, less energy is needed than when evaporating at normal atmospheric pressure. The ammonia in the incoming liquid is removed from the product flow by stripping and concentration into NH<sub>3</sub>-water (14% N). The evaporator further produces a Potassium concentrate (25% DM), ammonium sulphate by scrubbing the vapour coming out of the evaporator. And condensate.
- Clean water production (RO-IE): The condensate from ESS unit and the permeate from the RO is cleaned in the RO water polisher and the ion exchanger to achieve the right quality for discharge into surface waters.
- Input: livestock manure or digestate
- Output product(s): Mineral- and Potassium-concentrate, NH<sub>3</sub>-water, Ammonium sulphate, Clean dischargeable water
- Available capacity: 50.000, 125.000, 250.000 ton/year

#### Who is the vendor of the product?

VP-Hobe BV (<http://www.vp-hobe.nl/>) is a manure processing technology company in the Netherlands.

VP-Hobe is developed its own Manure Valorisation System using flotation, belt press sieve, reverse osmosis, evaporation and stripping technologies.



**Which other product/technologies are provided by the vendor?**

Products of this technology are P1504, 1527, 1528, 1529.

**Which are the advantages of the technology and the problems addressed?**

The different modules can be used in combination to obtain optimal valorization of the manure.

- High dry matter % in the solid fraction
- No use of iron salts which makes solid fraction better stackable or processable and no fixation of phosphorus by iron
- Low dry matter % of the liquid fraction
- Makes concentration via RO possible (No UF needed)
- Makes higher concentration in Evaporator possible
- Robust proven technology operated at own processing plants
- Lowest possible operational costs (energy, additives)
- Options. Only Solid Liquid plus RO or plus Stripper or plus Evaporator

**How does the technology work?**

See "What is the technology?".

**How/where to use the technology?**

Input: manure/digestate. Outputs: P1504, 1527, 1528, 1529.

**Fertilizer production**

The fertilizers produced with this technology are potential RENURE fertilizers. The production and usage of RENURE fertilizers allows farmers to process their (excess) livestock manure into a RENURE fertilizer. This means that application will no longer be defined as livestock manure in the Nitrates Directive. This means application will no longer be limited to 170 kg N/ha. RENURE fertilizers can replace chemical fertilizers.

Because the N and K can be separated in two fractions optimal N/K balance can be achieved using precision fertilizing techniques using biobased fertilizers.

**Which are the authority permits and in which EU countries?**

RENURE.

**How much does it cost?**

Please ask directly to the vendor.



For more information: [https://nutriman.net/farmer-platform/technology/id\\_669](https://nutriman.net/farmer-platform/technology/id_669)